



CHANGE IN AGRICULTURAL LAND USE IN THE NRPC REGION, 1974-1998

Data Overview

This report presents an attempt to capture time series data on agricultural uses in the format of a Geographical Information system (GIS) database which may be analyzed for acreage, distribution, soil potential index and relationship to development patterns, among other variables. During preparation for the draft 2001 Regional Plan, NRPC identified a need to monitor changes in agricultural land use in the region. The annual Census of Agriculture or local current use assessment information has traditionally been used to estimate agricultural use. However, both sources contain flaws. The Census information does not define actual acreage of land, but rather number of farms within acreage categories, and the Current Use records describe only properties exceeding 10 acres. In future efforts, the GIS data may be updated and related to existing parcel information to determine ownership and specific uses and to develop conservation strategies.

Source Data and Methodology

NRPC digitized agricultural properties for the NRPC region¹ for the years 1974 and 1998 through aerial photo interpretation. The horizon years were chosen because complete aerial photography is available. Data from 1974 was digitized from un-projected aerial photography from UNH Cooperative Extension and transformed to NH State Plane Feet, NAD 83, using PC ArcInfo operations. Boundaries coincident with street data were then fit to the current NH DOT Road Centerline shapefile. Data from 1998 was digitized from the statewide Digital Orthophoto coverage processed by USGS. Properties were digitized for use at a regional scale, or 1:12,000. While the 1998 imagery presented an opportunity for a larger scale, the quality and scale of the 1974 images (1:660) limited the overall level of detail.

NRPC digitized all areas clearly distinguishable as agricultural, including orchards, row crops and managed fields or pastures. The type of use (Field/Pasture, Orchard or Row Crop) was coded into the dataset as well as the source photograph name. Tree farms were not considered as site specific research is required to identify them. Orchards and row crops were easily identified given spatial appearance, however, defining field/pasture properties required judgement as to which properties to include. Generally, areas larger than 1 acre and absent significant structures were accepted with the assumption that they are being intentionally managed. No attempt was made to distinguish fallow areas from working pasture land.

Data Summary

The final product is two data layers for years 1974 and 1998 containing polygon representations of identified agricultural properties in each year. The maps that follow were generated from this newly created data.

1974

The distribution of agricultural land uses in 1974 is illustrated in Map 1 and the data is presented in Figure 1. The region has a total land area of 202,759 acres, and had 12,841 acres (6.3%) in agricultural uses in 1974. Of this agricultural land, the greatest area (2,910 acres or 22.7% of the region) was in Hollis and the lowest area was in Brookline (136 acres or 1.1% of the region). Hollis also had the greatest area of

¹ Communities of Amherst, Brookline, Hollis, Hudson, Litchfield, Lyndeborough, Merrimack, Milford, Mont Vernon, Nashua, Pelham and Wilton



agricultural soil types (5,275.6 acres or 27.3% of the region). The communities of Milford and Nashua ranked high in the distribution of agricultural soil types, however much of this land was developed for commercial or residential uses prior to 1974. After Hollis, the communities of Amherst, Wilton and Litchfield (1,391, 1,386 and 1,162 acres respectively) contained the greatest amounts of agricultural use.

Figure 1: Percent of Acres in Agricultural Land Use by Community, 1974

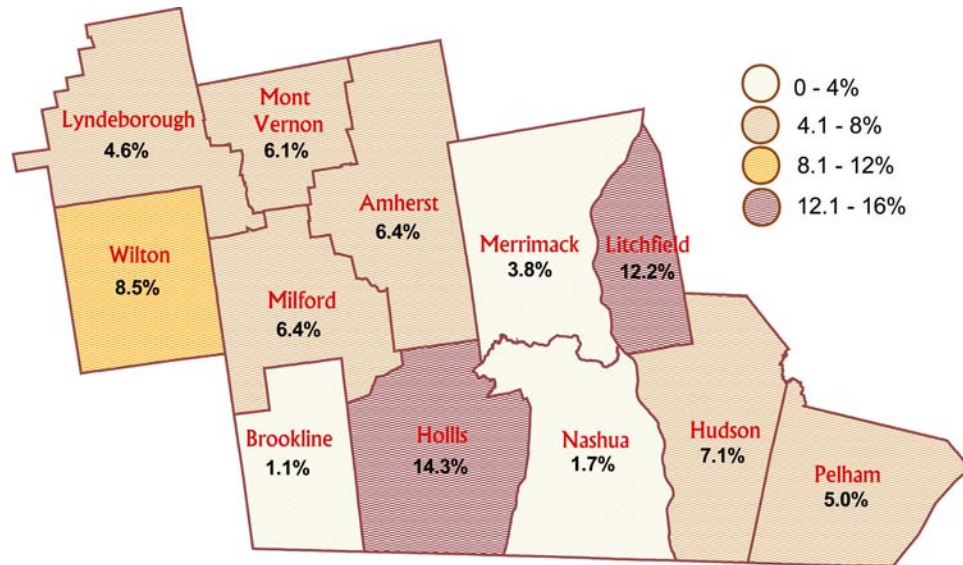
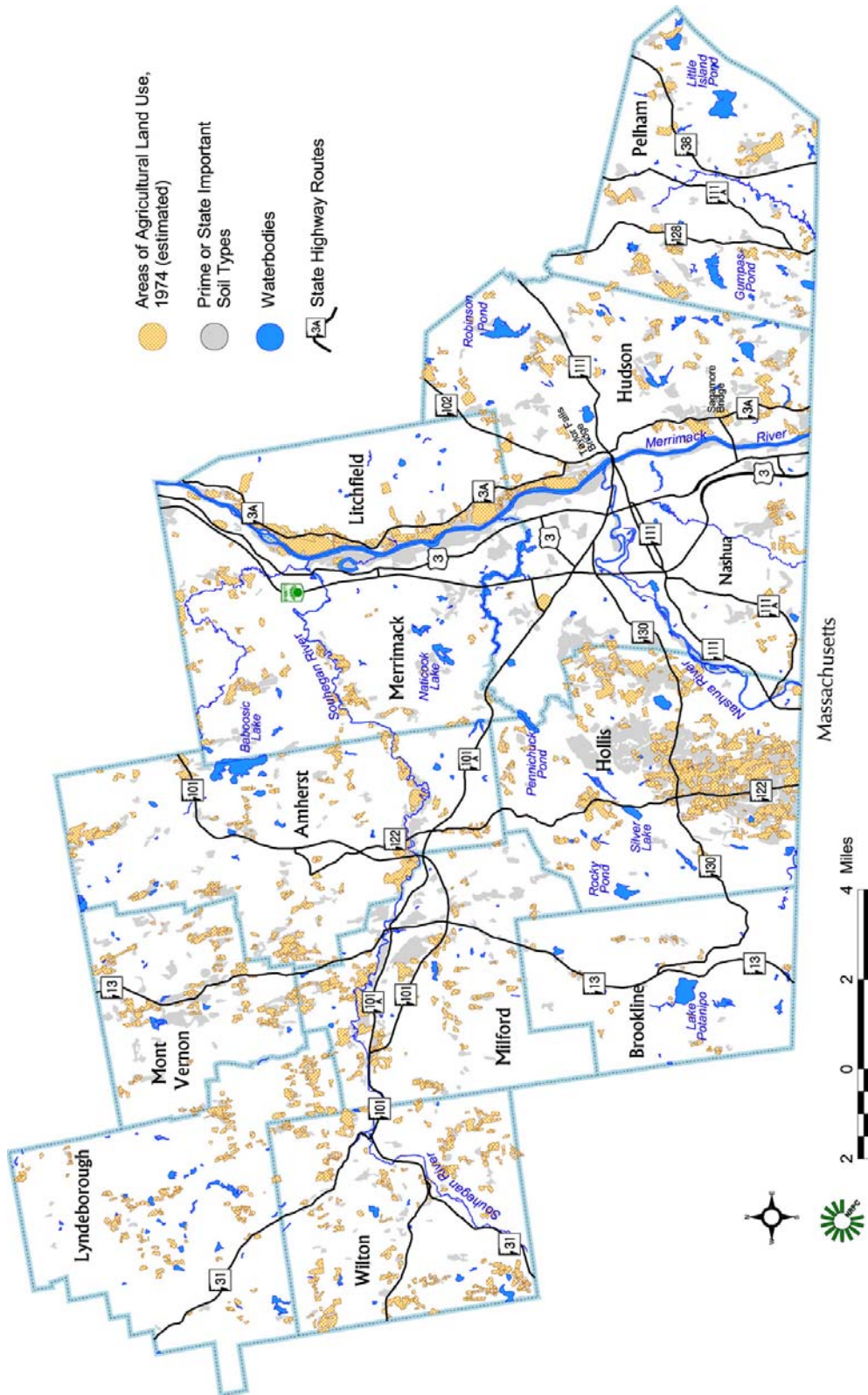


Table 1: Acreage of Soil Type and Agricultural Land Uses, 1974

Community	Land Area (acres)	Agricultural Soils (acres)						Agricultural Uses (1998)			
		Prime	State Important	Total	% of Community	% of Region	Rank	Acres	% of Community	% of Region	Rank
Amherst	21,692	816.6	925.9	1,742.5	8.0	9.0	4	1,391	6.4	10.8	2
Brookline	12,714		248.9	248.9	2.0	1.3	12	136	1.1	1.1	11
Hollis	20,304	2,460.1	2,815.6	5,275.6	26.0	27.3	1	2,910	14.3	22.7	1
Hudson	18,338	780.9	877.9	1,658.8	9.0	8.6	5	1,298	7.1	10.1	3
Litchfield	9,538	868.0	18.7	886.7	9.3	4.6	10	1,162	12.2	9.0	4
Lyndeborough	19,261	380.3	0	380.3	2.0	2.0	11	878	4.6	6.8	6
Merrimack	20,995	1,203.6	742.6	1,946.2	9.3	10.1	2	802	3.8	6.2	8
Milford	16,256	729.6	1,036.5	1,766.2	10.9	9.1	3	1,035	6.4	8.1	5
Mont Vernon	10,752	420.9	1,137.5	1,558.4	14.5	8.1	7	660	6.1	5.1	9
Nashua	19,797	667.5	953.9	1,621.4	8.2	8.4	6	345	1.7	2.7	10
Pelham	16,737	207.4	1,059.2	1,266.5	7.6	6.6	8	837	5.0	6.5	7
Wilton	16,375	974.4	0	974.4	6.0	5.0	9	1,386	8.5	10.8	2
Region	202,759	9,509	9,817	19,326.0	9.5	100.0		12,841	6.3	100.0	



Map 1: Areas of Agricultural Land Use, 1974



Map by NRPC. Properties identified and digitized in 2002 from 1974 aerial photography made available by UNH Cooperative Extension, Milford, NH



1998

The distribution of agricultural land uses in 1998 is illustrated in Map 2 and the data is presented in Figure 2 and Table 2. The region has a total land area of 202,759 acres, and had 8,485 acres (4.2%) in agricultural uses in 1998. Of this agricultural land, the greatest area (2,308 acres or 27% of the region) was in Hollis and the lowest area was in Brookline (24 acres or 0.3% of the region). Hollis also had the greatest area of agricultural soil types (5,275.6 acres or 27.3% of the region). After Hollis, the communities of Wilton, Amherst and Milford (1,150, 940 and 770 acres respectively) contained the greatest amounts of agricultural use.

Figure 2: Percent of Acres in Agricultural Land Use by Community, 1998

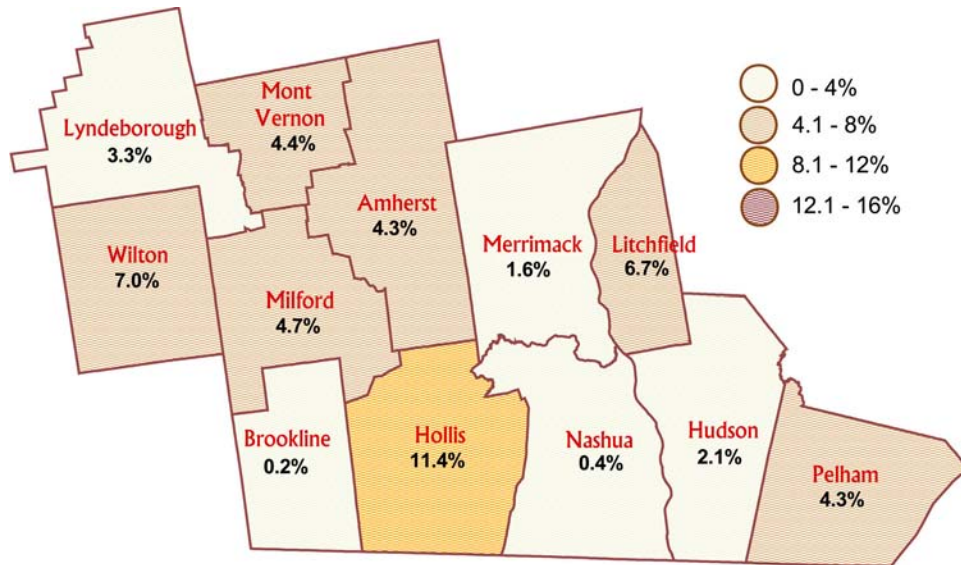
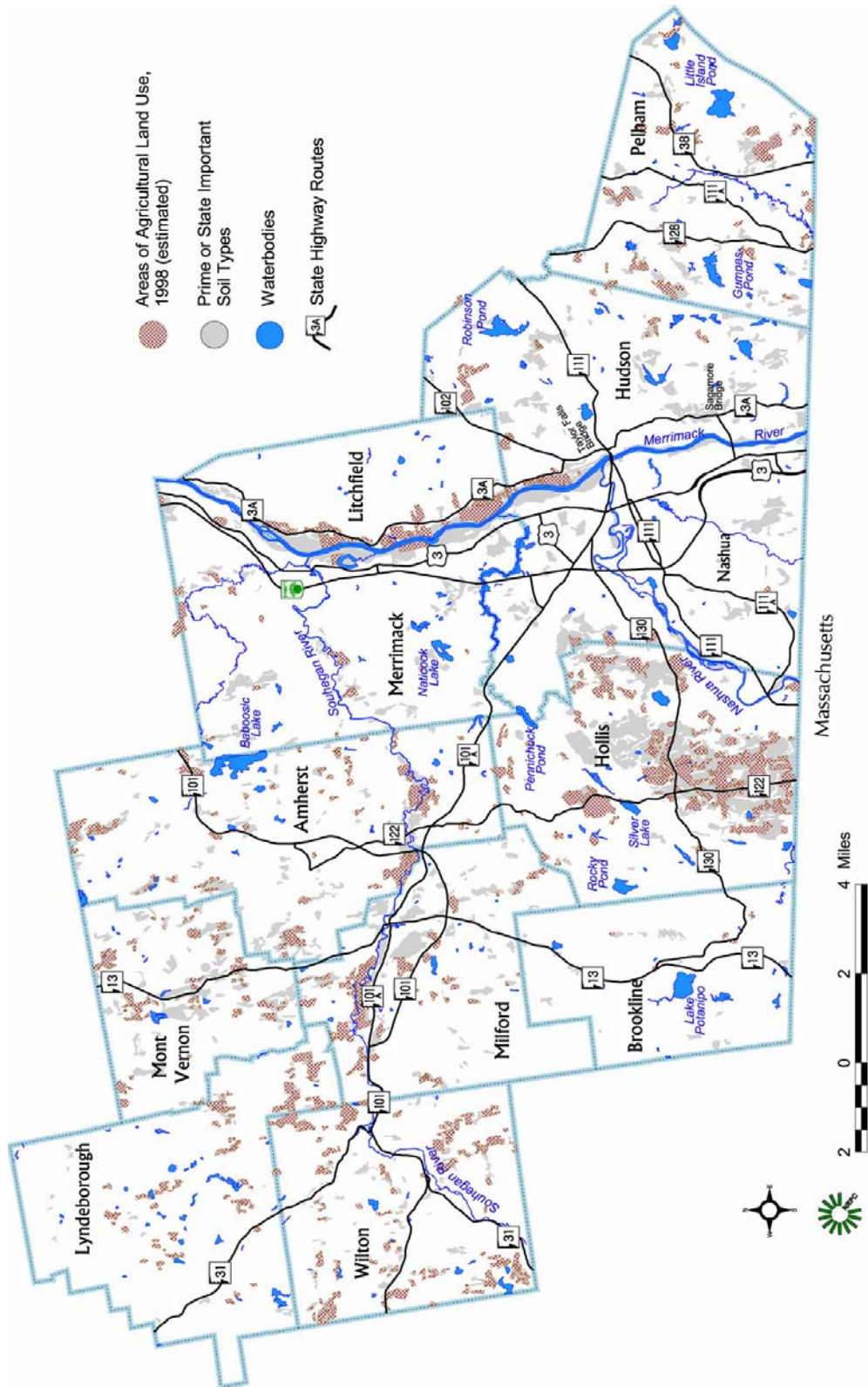


Table 2: Acreage of Soil Type and Agricultural Land Uses, 1998

Community	Land Area (acres)	Agricultural Soils (acres)					Agricultural Uses (1998)				
		Prime	State Important	Total	% of Community	% of Region	Rank	Acres	% of Community	% of Region	Rank
Amherst	21,692	816.6	925.9	1,742.5	8.0	9.0	4	940	4.3	11.1	3
Brookline	12,714		248.9	248.9	2.0	1.3	12	24	0.2	0.3	12
Hollis	20,304	2,460.1	2,815.6	5,275.6	26.0	27.3	1	2,308	11.4	27.2	1
Hudson	18,338	780.9	877.9	1,658.8	9.0	8.6	5	385	2.1	4.5	9
Litchfield	9,538	868.0	18.7	886.7	9.3	4.6	10	639	6.7	7.5	7
Lyndeborough	19,261	380.3		380.3	2.0	2.0	11	643	3.3	7.6	6
Merrimack	20,995	1,203.6	742.6	1,946.2	9.3	10.1	2	338	1.6	4.0	10
Milford	16,256	729.6	1,036.5	1,766.2	10.9	9.1	3	770	4.7	9.1	4
Mont Vernon	10,752	420.9	1,137.5	1,558.4	14.5	8.1	7	476	4.4	5.6	8
Nashua	19,797	667.5	953.9	1,621.4	8.2	8.4	6	88	0.4	1.0	11
Pelham	16,737	207.4	1,059.2	1,266.5	7.6	6.6	8	724	4.3	8.5	5
Wilton	16,375	974.4		974.4	6.0	5.0	9	1,150	7.0	13.5	2
Region	202,759	9,509	9,817	19,326.0	9.5	100.0		8,485	4.2	100.0	



Map 2. Areas of Agricultural Land Use, 1998



Map by NRPC. Properties identified and digitized in 2002 from 1998 digital orthoquad coverage made available by NH DOT.



The percentage change in agricultural use from 1974-98 is illustrated on Map 3. Between 1974 and 1998, every community in the region lost agricultural land to either development or re-forestation. In 1974, a total of 12,841 acres was identified (6.3% of the region) and in 1998, 8,465 acres (4.2% of the region) was identified, indicating an overall loss of 4,355 acres or 33.9%. The greatest *percentage* loss was in Brookline (-82.3%) however, the greatest *area* of loss occurred in Hudson (-912 acres), followed by Hollis (-601.7 acres) and Litchfield (-522.7 acres). Despite losing 601 acres, Hollis had a slower rate of decrease than did the other communities. The Hollis percent of agricultural land in the region shifted from 22.7% in 1974 to 27.2% in 1998, despite a 20.7% decrease in acreage in that community.

Figure 3: Percent Change in Agricultural Land Use by Community, 1974-1998

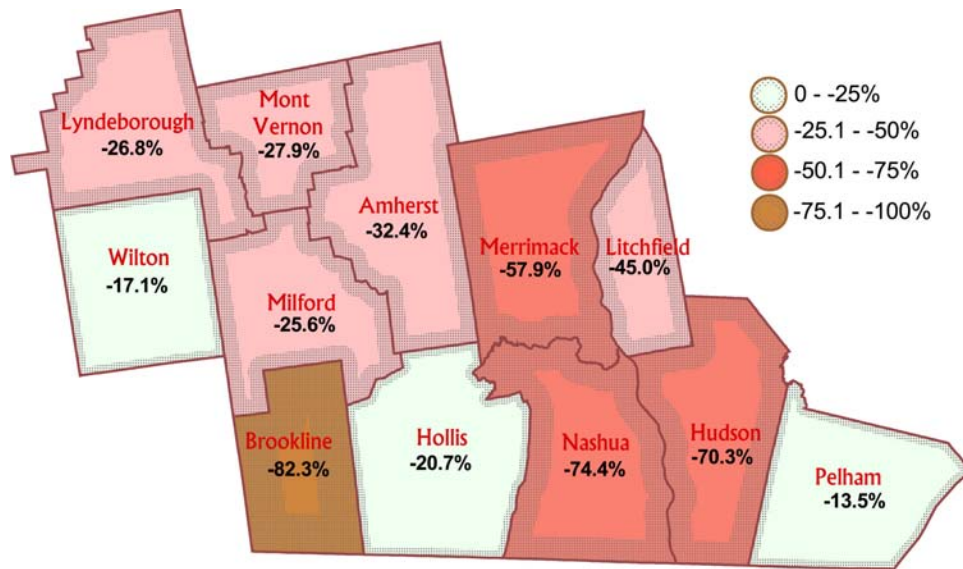
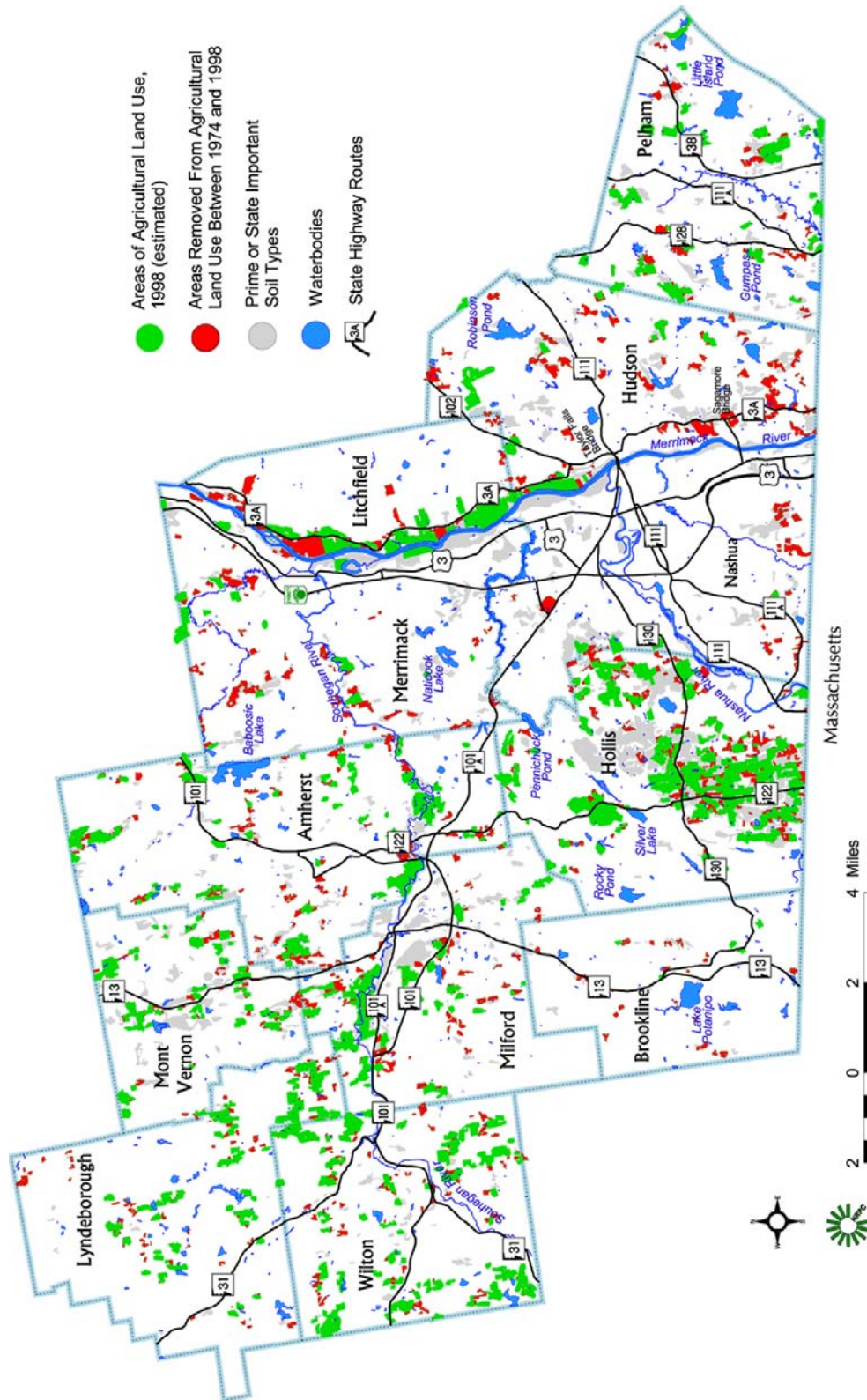


Table 3: Change in Agricultural Acreage, 1974-1998

Community	Land Area (acres)	Agricultural Uses (1974)				Agricultural Uses (1998)				Change	
		Acres	% of Community	% of Region	Rank	Acres	% of Community	% of Region	Rank	Total Change	% Change
Amherst	21,692	1,391	6.4	10.8	2	940	4.3	11.1	3	-451.2	-32.4
Brookline	12,714	136	1.1	1.1	11	24	0.2	0.3	12	-112.2	-82.3
Hollis	20,304	2,910	14.3	22.7	1	2,308	11.4	27.2	1	-601.7	-20.7
Hudson	18,338	1,298	7.1	10.1	3	385	2.1	4.5	9	-912.6	-70.3
Litchfield	9,538	1,162	12.2	9.0	4	639	6.7	7.5	7	-522.7	-45.0
Lyndeborough	19,261	878	4.6	6.8	6	643	3.3	7.6	6	-235.3	-26.8
Merrimack	20,995	802	3.8	6.2	8	338	1.6	4.0	10	-464.6	-57.9
Milford	16,256	1,035	6.4	8.1	5	770	4.7	9.1	4	-264.9	-25.6
Mont Vernon	10,752	660	6.1	5.1	9	476	4.4	5.6	8	-184.0	-27.9
Nashua	19,797	345	1.7	2.7	10	88	0.4	1.0	11	-256.5	-74.4
Pelham	16,737	837	5.0	6.5	7	724	4.3	8.5	5	-113.1	-13.5
Wilton	16,375	1,386	8.5	10.8	2	1,150	7.0	13.5	2	-236.8	-17.1
Region	202,759	12,841	6.3	100.0		8,485	4.2	100.0		-4355.5	-33.9



Map 3: Changes in Agricultural Land Use, 1974-1998



Map by NRPC. Properties identified and digitized by NRPC staff from 1974 aerial photography and 1998 digital orthoquads. This map presents a comparison of those two layers.